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09/486,480	10/25/2000	James A. Spudich	18557A-00021	9741

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EXAMINER

DEVI, SARVAMANGALA J N

ART UNIT	PAPER NUMBER
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1645

DATE MAILED: 12/29/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/486,480

Applicant(s)

SPUDICH ET AL.

Examiner

S. Devi, Ph.D.

Art Unit

1645

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 October 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-13 and 56-91 ~~is/are~~ are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 13, 71-74, 78-80 and 82 ~~is/are~~ are allowed.
- 6) ☒ Claim(s) 1-12, 56-70, 75-77, 81 and 83-91 ~~is/are~~ are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 102003.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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RESPONSE TO APPLICANTS' AMENDMENT

Applicants' Amendment

- 1) Acknowledgment is made of Applicants' amendment filed 10/20/03 in response to the non-final Office Action mailed 07/15/03.

Status of Claims

- 2) Claims 1, 4, 8 and 9 have been amended via the amendment filed 10/20/03.

Although indicated incorrectly as '(Previously Amended)', claim 6 has also been amended via the amendment filed 10/20/03.

New claims 56-91 have been added via the amendment filed 04/08/03.

Claims 1-13 and 56-91 are pending and are under examination.

Information Disclosure Statement

- 3) Acknowledgment is made of Applicants' information disclosure statement filed 10/20/03. Since the references cited therein were previously cited by the Office on PTO 892, the information referred to therein has been lined through and a signed copy is attached to this Office Action.

Prior Citation of Title 35 Sections

- 4) The text of those sections of Title 35 U.S. Code not included in this action can be found in a prior Office Action.

Prior Citation of References

- 5) The references cited or used as prior art in support of one or more rejections in the instant Office Action and not included on an attached form PTO-892 or form PTO-1449 have been previously cited and made of record.

Rejection(s) Withdrawn

- 6) The rejection of claims 1-12 made in paragraph 13 of the Office Action mailed 07/15/03 under 35 U.S.C. § 103(a) as being unpatentable over Sassenfeld *et al.* (*Biotechnol.* 2: 76-81, 1984, already of record) in view of Suzuki *et al.* (4,629,713) and Pinnavaia *et al.* (US 5,993,769), is withdrawn in light of Applicants' amendments to the base claim.

New Rejection(s)

Applicants are asked to note the following new rejection(s) made in this Office. The new rejections are necessitated by Applicants' amendments and/or the submission of new claims.

Rejection(s) under 35 U.S.C § 112, First Paragraph (New Matter)

7) Claims 1-12, 56-70, 77 and 83-91 are rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor, at the time the application was filed, had possession of the claimed invention. This is a new matter rejection.

Instant claim 1, as amended, includes the limitations: ‘said moiety attached to said surface of said layered silicate, wherein the quantity of the attached moiety that detaches from said surface when contacted with a solution comprising a concentration of arginine chosen from one or more concentrations in the range from 25 mM to 100 mM is higher than the quantity of the attached moiety that detaches from said surface when contacted with a solution comprising the same chosen concentration of cations chosen from one or more of sodium cations and magnesium cations’. Claim 56 depends from claim 1 and includes a magnesium cation concentration range of 25 mM to 250 mM. Claim 58, also dependent from claim 1, includes a sodium cation concentration range of 50 mM to 250 mM. Likewise, claim 60, dependent from claim 1, includes a potassium cation concentration range of 25 mM to 250 mM. Claim 61 is dependent from claim 1 and includes an arginine and potassium cation concentration range of 25 mM to 100 mM. Claim 63 depends from claim 1 and includes an arginine concentration range of 10 mM to 100 mM. Applicants point to Figure 3 and/or 4A and 4C as providing descriptive support for the added limitations and for new claims. Claim 70 is dependent from claim 13, which is drawn to a method of attaching a specific protein, such as, DNA binding protein, a molecular motor, an actin filament, a microtubule, a myosin filament, an actin binding protein, and a myosin filament binding protein. Claim 70 includes limitations on the arginine, sodium and magnesium cation concentration ranges of 25 mM to 100 mM. However, Figures 3 and 4A-4C do not represent the results obtained with a DNA binding protein, a molecular motor, an actin filament, a microtubule, a myosin filament, an actin binding protein, and a myosin filament binding protein. Similar criticism applies to claims 83-91, all of which depend from claim 13. The concentration of sodium salt recited in claim 76, as applicable to the specific protein species recited in the base claim 13, is also new matter. The limitations identified above in the claims are considered to be new matter. *In re Rasmussen*, 650 F.2d 1212 (CCPA, 1981). New matter includes not only the addition of wholly unsupported subject matter but also, adding specific percentages or compounds

after a broader original disclosure, or even omission of a step from a method. See M.P.E.P 608.04 to 608.04(c).

Figure 3 is limited to the release of specific amounts of the specific protein, GFP, when NaCl salt was used in consecutive washes at three specific concentrations of 50 mM, 125 mM and 250 mM followed by a wash with 100 mM of arginine. Figure 3 is not supportive of the lower concentration limit of 25 mM or the concentration of 100 mM for NaCl. Figure 4A is limited to a showing of elution of the specific protein, GFP, when MgCl₂ salt was used at four different concentrations of 25 mM, 50 mM, 125 mM and 250 mM. Figure 4B is limited to a showing of elution of the specific protein, GFP, when KCl salt was used at four different concentrations of 25 mM, 50 mM, 125 mM and 250 mM. Figures 4A and 4B are supportive of a concentration of 100 mM for arginine, but not for sodium, potassium and magnesium cations. Figure 4C is limited to a showing of elution of the specific protein, GFP, when arginine was used specifically at four different concentrations of 10 mM, 25 mM, 50 mM and 100 mM. There is no support in the specification, as originally filed, for the wide range as recited currently in the instant claims. Furthermore, these Figures do not and cannot provide descriptive support for the specific moiety species, i.e., the specific protein moiety species recited or encompassed in claims 70-91, i.e., DNA binding protein, a molecular motor, an actin filament, a microtubule, a myosin filament, an actin binding protein, and a myosin filament binding protein. These Figures do not provide descriptive support for the broad genus 'moiety' claimed generically in claims 1-8, 56-68, 77 and 83-91, or for the specific 'antibody' moiety species claimed in claim 69. There is no support for any 'moiety' other than the GFP protein moiety being released from the surface of the layered silicate at the specific concentrations or concentration ranges of arginine, or sodium, potassium or magnesium cations, as recited currently.

Applicants are respectfully requested to remove the new matter from the claim(s), or invited to point to specific pages and line numbers in the originally filed specification where support for such a recitation can be found.

Rejection(s) under 35 U.S.C § 112, First Paragraph

8) Claims 1-12, 56-70, 77 and 83-91 are rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had

possession of the claimed invention. This is a written description rejection.

It is noted that the generic 'moiety' recited in the claimed method does not exist independent of its function, i.e., attachment to or detachment from the layered silicate surface, or ionic interactions with sodium, potassium, or magnesium ions, and arginine. The term 'moiety' includes an innumerable number of articles and molecules including, microscopic and macroscopic, animate and inanimate objects; biological and non-biological substances or molecules; microorganisms; proteinaceous or non-proteinaceous moieties. The term 'biological molecule' includes a myriad of molecules including cells, tissues, organelles, lipids, carbohydrates, glycoproteins, glycolipids, lipopolysaccharides etc. each having different molecular make-up, charge, relative affinity, avidity, and binding or detachment ability. The only moiety that has been shown within the instant specification to get released from the layered silicate surface at some quantitative level and at the concentrations of sodium, magnesium, potassium salts, or of arginine is the GBP protein moiety. See Figures 3 and 4. Even with regard to the detachment pattern of this GBP moiety, a meaningful analysis of these two Figures is not possible since Figure descriptions provided on page 8 are inconsistent with what is depicted in the Figures. For instance, at the bottom of page 8 of the specification, GFPR₆ and GFPH6R₆ are described as being shown in black and light gray respectively. However, no such distinction can be made in Figures 3 and 4, which represent unfilled and shaded bars without indicating which bar represents GFPR₆ and which bar represents GFPH6R₆. The specification in the last paragraph of page 40 states that analogous experiments were carried out with another protein moiety, glutathione-S-transferase, although no data are provided. Other than these two protein moieties, no other animate and inanimate objects; biological and non-biological substances or molecules; non-proteinaceous moieties including lipids, carbohydrates, glycoproteins, glycolipids, and lipopolysaccharides are shown to work in the method at the recited arginine or salt concentration ranges. While the specification merely recites moiety species, such as, DNA binding protein, a molecular motor, an actin filament, a microtubule, a myosin filament, an actin binding protein, a myosin filament binding protein, or an antibody, there is no showing that all these moieties were detached or eluted from the layered silicate surface in quantitative levels as recited when sodium, potassium and magnesium chloride as well as arginine solutions were used at the recited concentration range(s). There is no showing nor is it predictable that all these non-GBP moiety

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species of distinct molecular make-up detach from the layered silicate surface in a higher quantity at one or more of the recited arginine concentrations compared to the level of the same moiety detached from said surface when contacted with a solution comprising the same concentrations of the recited cations. The *Written Description Guidelines* state:

There is an inverse correlation between the level of predictability in the art and the amount of disclosure necessary to satisfy the written description requirement. For example, if there is a well-established correlation between the structure and function in the art, one skilled in the art will be able to reasonably predict the complete structure of the claimed invention from its function.

A mere statement that the invention or the method includes a specific step which results in the detachment of biological or non-biological moieties at the recited concentrations of arginine or the recited concentrations of salts is insufficient to meet the adequate written description requirement of the claimed invention. A convincing relationship has to exist between the structure of the moiety and interactive properties of the moiety and its detachment function in the presence of arginine, sodium chloride, potassium chloride or magnesium chloride. The interactive ability and detachment functions of one protein moiety cannot be automatically extrapolated to any other generic moiety. Applicants have not shown that the interactive ability and the detachment functions of a reference protein moiety as claimed would automatically predict that the method would be operative with any generic 'moiety' and would bring about similar results. The specification fails to teach that the method would work as claimed with a representative number of species of 'moieties', sufficient to allow one skilled in the art to determine that the inventors had possession of the invention as claimed. With the exception of a GBP protein moiety and a potential GST moiety, a skilled artisan cannot envision the detailed structure/nature of all the species encompassed by the recited 'moiety' and predict their relative detachment capacities at the various concentrations of the recited cations or arginine. Regardless of the complexity or simplicity of the method, conception cannot be achieved until reduction to practice has occurred. Adequate written description requires more than a mere statement that it is a part of the invention and a reference to a potential method of performing it. See *Fiers v. Revel*, 25 USPQ2d 1601, 1606 (CAFC 1993) and *Amgen Inc. v. Chugai Pharmaceutical Co. Ltd.*, 18 USPQ2d 1016.

Rejection(s) under 35 U.S.C § 112, Second Paragraph

9) Claims 1-12, 56-70, 75-77, 81 and 83-91 are rejected under 35 U.S.C § 112, second paragraph, as being indefinite, for failing to particularly point out and distinctly claim the subject

matter which Applicants regard as the invention.

(a) Claim 1 is vague, indefinite and confusing because line 1 of the claim indicates that what is claimed is a method of attaching a moiety to a surface of a layered silicate. However, what is accomplished at the end is a method of detachment of a moiety from the surface of a layered silicate in a higher quantity using a solution containing specific concentrations of arginine compared to the same concentrations of sodium or magnesium salts. It is unclear whether the claimed method is a method of attaching a moiety, or a method of detaching a moiety from the said surface.

(b) Analogous criticism applies to claims 70 and 83-91.

(c) Claim 6, which depends from claim 1, is vague and confusing in the recitation: 'a sodium salt in a concentration sufficient to remove molecules bound to said surface', because it is unclear what are encompassed in 'molecules', i.e., whether these molecules include or exclude 'the moiety'. Is the solution of sodium salt recited/used in claim 6 different from the solution comprising sodium cations recited/used in claim 1. If same, then claim 6 is improperly broadening in scope with regard to this sodium-containing solution, because the solution recited in claim 1 is of specific concentration, whereas the solution recited in claim 6 has no limit placed on its concentration. Clarification/correction is requested.

(d) Claim 75, which depends from claim 13, is vague and confusing in the recitation: 'a sodium salt in a concentration sufficient to remove molecules bound to said surface', because it is unclear what are encompassed in 'molecules', i.e., whether these molecules include or exclude the 'protein'.

(e) Claims 1, 70 and those that depend from these claims are indefinite and confusing for failing to distinctly claim the subject matter, in that they include recitations contrary to what is demonstrated in the specification. For instance, at a concentration of 50 mM arginine, the quantity of an attached protein (GFP) moiety that detaches from the surface of the layered silicate is not higher than the quantity that is detached at 50 mM concentration of potassium chloride, magnesium chloride or sodium chloride. See Figures 3 and 4.

(f) Claim 7 is vague and indefinite and appears to be improperly broadening in scope with regard to the 'at least 1 mM' sodium salt concentration. Claim 7 depends from claim 6, which in turn depends from claim 1. The concentration of the sodium-containing solution of claim 1 is limited to

the range, 25 mM to 100 mM. However, the limitation 'at least 1 mM' in claim 7 encompasses concentrations that are not within the range of 25 mM to 100 mM, but outside this range. Is this sodium solution different from the one used in claim 1?

(g) Claim 56 is indefinite and improperly broadening in scope. Claim 56 depends from claim 1, wherein the concentration of magnesium cations is limited to a range of 25 mM to 100 mM. However, the dependent claim 56 includes a concentration of magnesium cations which is partly outside this range, i.e., 25 mM to 250 mM.

(h) Similar criticism applies to claims 58 and 60.

(i) Claims 57 and 59 are indefinite and improperly broadening in scope. Claims 57 and 59 depend from claim 1, wherein the concentration of magnesium and sodium cations is limited to a range of 25 mM to 100 mM. However, the dependent claims 57 and 59 improperly include a concentration of magnesium or sodium cations which is outside this range, i.e., 125 mM and 250 mM.

(j) In claims 57, 59, 64, 70, 84, 86 and 91, the precise meaning or the purpose of the recitation 'one or more' is unclear.

(k) Claims 63 and 64 are indefinite and improperly broadening in scope. Claims 63 and 64 depend from claim 1, wherein the concentration of arginine is limited to a range of 25 mM to 100 mM. However, the dependent claims 63 and 64 improperly include a concentration of arginine outside of this range, i.e., 10 mM.

(l) Claim 70 has improper antecedence in the limitations: 'said moiety' and 'the attached moiety'. Claim 70 depends from claim 13, which does not recite any 'moiety'.

(m) Claim 77 has improper antecedence in the limitation: 'said moiety'. Claim 77 depends from claim 13, which does not recite any 'moiety'.

(n) Claims 83-86, 88 and 89 have improper antecedence in the limitation: 'the attached moiety'. These claims depend from claim 13, which does not recite any 'moiety'.

(o) Claims 87, 90 and 91 have improper antecedence in the limitation: 'said moiety'. These claims depend from claim 13, which does not recite any 'moiety'.

(p) Claims 60-62 are confusing. These claims recite detachment of the attached moiety when the surface is contacted with a solution comprising potassium cations. Claims 60-62 depend

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from claim 1, which does not recite any potassium cations. It is unclear whether the contacting with a solution containing potassium cations in claims 60-62 is in addition to contacting with a solution comprising sodium and magnesium cations, or whether potassium cations are comprised within the cationic solution recited in the base claim.

(q) Claims 2-12, 56-70, 75-77, 81 and 83-91, which depend directly or indirectly from claim 1 or claim 75, are also rejected as being indefinite because of the vagueness or indefiniteness identified above in the base claim.

Objection(s)

10) Claims 65 and 81 are objected to for the misspelled words: 'montmorilonite' and 'hentonite'.

Remarks

11) Claims 1-12, 56-70, 75-77, 81 and 83-91 stand rejected. Claims 13, 71-74, 78-80 and 82 are allowable.

12) Applicants' amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See M.P.E.P § 706.07(a). Applicants are reminded of the extension of time policy as set forth in 37 C.F.R 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

13) Papers related to this application may be submitted to Group 1600, AU 1645 by facsimile transmission. Papers should be transmitted via the PTO Fax Center located in Crystal Mall 1. The transmission of such papers by facsimile must conform with the notice published in the Official Gazette, 1096 OG 30, November 15, 1989. The CM1 facsimile center's telephone number is (703) 308-4242, which is able to receive transmissions 24 hours a day and 7 days a week. The RightFax number for submission of before-final amendments is (703) 872-9306. The RightFax number for submission of after-final amendments is (703) 872-9307.


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14) Any inquiry concerning this communication or earlier communications from the Examiner should be directed to S. Devi, Ph.D., whose telephone number is (703) 308-9347. A message may be left on the Examiner's voice mail system. The Examiner can normally be reached on Monday to Friday from 7.15 a.m. to 4.15 p.m. except one day each bi-week, which would be disclosed on the Examiner's voice mail system.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Lynette Smith, can be reached on (703) 308-3909.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0196.

December, 2003


S. DEVI, PH.D.
PRIMARY EXAMINER